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Desalting and Water Purification Research Program

Novel Two-phase Cleaning Technology – Pilot Scale Testing

DWPR Report #121, M. Labib et al., Novaflux Technologies

Background:

During the first phase of the project Novaflux developed and tested a method of incorporating liquid droplets of a cleaning solution into an air stream as it enters a spiral wound membrane cartridge.

Objective:

Increase cleaning efficiency and reduce cleaning solution volume and cleaning time requirements.

Pilot Test:

RO elements used to treat high total dissolved solids dairy wastewater were cleaned using the two phase system using air

and their special cleaning solution with air to liquid ratios in the range of 50:1 to 6000:1. The cleaning mixture, air plus solution droplets, was introduced to the element at a velocity of 30 feet per second.

Conclusions:

Two phase cleaning method required 30 minutes compared to 4-8 hours for conventional cleaning and half as much cleaning solution (15 gallons compared to 30 gallons for conventional cleaning). Two-phase rinsing required only a few minutes and 1 gallon of water to rinse 6 elements compared to one hour and 50 gallons for conventional rinsing. Air requirements for two phase cleaning were 50-70 standard cubic feet per minute for two 4" diameter elements. Cleaning of two elements in series in a vessel was also demonstrated.

